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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/525,458

09/28/2005

Kazuo Kubota

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3849

2292 7590 05/13/2008  
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EXAMINER

CORDRAY, DENNIS R

ART UNIT

PAPER NUMBER

1791

NOTIFICATION DATE

DELIVERY MODE

05/13/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/525,458	<b>Applicant(s)</b> KUBOTA ET AL.	
	<b>Examiner</b> DENNIS CORDRAY	<b>Art Unit</b> 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 April 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-10,13-15 and 18-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-10,13-15 and 18-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Oath/Declaration***

The Declaration of Zembei Meiwa under 37 CFR 1.132 filed 4/7/2008 is acknowledged but is insufficient to overcome the rejection of claims as currently set forth. The data appear to show advantages of vinyl acetate polymers polymerized in the presence of a cationic starch over similar polymers polymerized with no starch or in the presence of cationic polyvinyl alcohol or an amphoteric starch. Additionally, advantages of the vinyl acetate polymers over styrene polymers polymerized in the presence of non-cationic polyvinyl alcohol.

The data fail to provide adequate support for scope of the claimed invention, which embodies starch having a broad range of nitrogen content, polymers (B) comprising any vinyl fatty ester, a very broad compositional range of cationic starch and polymer particles, emulsions having a broad range of polymer solids content and a broad range of polymer particle size. There is no support for the use of a synthetic cationic polymer in place of the starch. There are also no data supporting unobvious advantages of polymers having the very specifically claimed vinyl fatty ester content with respect to those having a vinyl fatty ester content just outside of the claimed range or well outside of the claimed range.

### ***Response to Arguments***

By this Office Action, the finality of the previous Office Action is hereby vacated and prosecution reopened. The Amendments to the Claims, filed 4/7/2008, has been entered.

Applicant's arguments, see pp 11-12, filed 4/7/2008, with respect to the rejection(s) of claim(s) 1-3, 5-10, 13-15 and 18-20 under Pfohl et al in view of others have been fully considered and are persuasive. Pfohl et al discloses a water soluble vinyl acetate polymer that is used as a solution in water rather than as an emulsion (col 3, lines 46-61). Therefore, the rejection has been withdrawn.

However, upon further consideration, new grounds of rejection are made as detailed below.

Regarding the argument that the Examiner has miscalculated the weight percent of vinyl acetate, Pfohl et al discloses embodiments wherein the copolymerized vinyl acetate is not hydrolyzed but up to 100% of the N-vinylformamide is hydrolyzed. In the embodiment wherein 100% of the N-vinylformamide is hydrolyzed, as highlighted in the rejection, the calculations are correct.

Regarding the argument that Auhorn et al only discloses an amount of vinyl acetate in the polymer of 80% or less, the reference teaches using the claimed cationic starch and the claimed cationic synthetic polymers as functionally equivalent options in the polymerization of vinyl polymers comprising vinyl fatty acid monomers. Niinikoski et al teaches the claimed cationic starches are also used in polymerizing vinyl acetate polymers overlapping the claimed polymers. Absent convincing evidence of unobvious advantages, it would have been obvious to one of ordinary skill in the art to use the claimed cationic synthetic polymers as functional equivalents to the claimed cationic starch in polymerizing the vinyl acetate polymers of Niinikoski et al and to have a reasonable expectation of success.

Regarding the argument that using the cationic compound A or A' results in superior advantages, the provided data are not convincing, as discussed above in the response to the Declaration of Zembei Meiwa.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 5-8, 10, 13-14 and 18 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Niinikoski et al (6753377) as evidenced by Carraher, Jr. ("Polymer Chemistry", 4<sup>th</sup> ed, Marcel Dekker, Inc., 1996).

Claims 1, 2, 5-6, 10, and 18: Niinikoski et al discloses a method of making paper comprising adding a polymer dispersion to a pulp at the wet end of a paper machine (mixing a pulp slurry and a polymer emulsion at the time of papermaking) (Abs; col 1, lines 4-55; col 2, lines 13-16; col 5, lines 21-25). The dispersion is formed by

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polymerizing from 60 to 95% of a monomer mixture in the presence of from 5 to 40% of a cationic starch having a degree of cationic substitution from 0.01 to 1. Using the preferred cationizing species, 2,3-epoxypropyltrimethyl ammonium chloride, the nitrogen content of the disclosed cationized starch is calculated to be from 0.09 to 4.5 wt-%, which significantly overlaps the claimed nitrogen content (col 3, lines 28-56). The monomers, which can be vinyl acetate monomers in some embodiments, are polymerized in a multi-step dispersion polymerization process resulting in an aqueous polymer dispersion comprising polyvinyl acetate and cationic starch and having a solids content of from 10% to 60% (col 4, lines 8-67).

Niinikoski et al does not disclose filtering the stock on a wire mesh to drain water and form a paper layer, but does disclose making paper on a gap former machine, which filters the papermaking slurry through a wire mesh. Niinikoski et al also discloses examples wherein paper is made on a paper machine using a web width of 1 meter, thus implicitly describing an apparatus that drains the pulp through a screen. Alternatively, such process is well known in the conventional art, as admitted by Applicant on p 7 of the response received 10/24/2007, and would have been obvious to one of ordinary skill.

Niinikoski et al does not disclose an emulsion of the polymer particles and starch. However, the disclosed composition is substantially identical to the claimed composition, an aqueous mixture comprising a cationic starch and polymer particles, thus will form the claimed emulsion or, at least, formation of an emulsion would have been obvious to one of ordinary skill in the art. Alternatively, using an emulsion would

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have been obvious as a functionally equivalent option absent evidence of unobvious results.

The disclosed method and composition significantly overlaps the claimed subject matter, thus improving the stiffness of the paper would have been obvious because, where the claimed and prior art apparatus or product are identical or substantially identical in structure or composition, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). In other words, when the structure recited in the reference is substantially identical to that of the claims, the claimed properties or functions are presumed to be inherent.

Claim 3: Polyvinyl acetate homopolymers have a Tg of 28 °C (see Carraher, Jr, p 28, Table 2.2 for evidence).

Claim 7 is product-by-process claim. The product of Niinikoski et al appears to be the same as or similar to the claimed product, a paper or pulp sheet comprising a natural or synthetic cationic polymer and vinyl fatty ester polymer particles, although produced by a different process. The burden therefore shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir.1983). "In the event any differences can be shown for the product of the product-by-process claim 7 as opposed to the product taught by Niinikoski et al et al, such differences would have been obvious to one of ordinary skill in the art as a routine

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modification of the product in the absence of a showing of unexpected results: see also *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)”

Claim 8: An example is disclosed wherein the dispersion is added in the amount of 1.5%, based on active size (solids content) to dry pulp (col 6, lines 55-67; col 7, lines 1-14, Example 5). Considering the 25% filler and 0.8% pulp starch added in the example as part of the sheet weight, the amount of dispersion added is within the claimed range.

Claims 13 and 14: Anionic monomers and nonionic-hydrophilic group containing monomers are not required by Niinikoski et al, although acrylonitrile is recited as a suitable monomer or comonomer (hydrophilic) (col 3, lines 28-29).

Claims 9, 15 and 19-20 are rejected under 35 U.S.C. 103(a) as unpatentable over Niinikoski et al in view of Auhorn et al (4908240).

Niinikoski et al does not disclose the presence of a natural or synthetic cationic polymer. Niinikoski et al also does not disclose the particle size of the vinyl acetate polymers.

Auhorn et al discloses a cationic aqueous polymer dispersion comprising vinyl acetate, vinyl propionate and/or other ethylenically unsaturated monomers (col 4, lines 5-19 and 45-60). In one embodiment, the polymerization of the monomers is conducted in the presence of a cationic emulsifier, a low molecular weight polymer containing from 5 to 100% by weight of a nitrogen-containing monomer as copolymerized units (col 2, lines 56-58; col 3, lines 26-42; col 3, line 58 to col 4, line 8). Specific examples of



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nitrogen containing compounds disclosed include dimethylaminoethyl (meth)acrylate, diethylaminoethyl (meth)acrylate, dimethylaminopropyl (meth)acrylate, dibutylaminopropyl (meth)acrylate, dimethylaminoneopentyl acrylate, (meth)acrylamidodimethylpropylamine, methacrylamidodiethylpropylamine and their quaternary salts obtained using benzyl chloride, methyl chloride, ethyl chloride, and others (col 3, lines 26-42). The nitrogen content of the emulsifier can be calculated. Using, for example, dimethylaminoethyl acrylate quaternized with methyl chloride (molecular weight of 158 for the monomer unit without the chloride), the nitrogen content of the polymer ranges from 0.44 to 8.8 wt-%, which significantly overlays the claimed range. Using benzyl chloride as the quaternizing agent, the nitrogen content ranges from 0.3 to 6 wt-%. For the other higher molecular weight monomers, the nitrogen content is even lower.

In a second embodiment, the polymerization dispersion comprises, by weight, 10-56 parts of the monomer mixture and 100 parts of a 1.5-25 wt-% aqueous solution of a cationic starch (col 4, lines 22-39). The proportion of starch to monomer mixture (or to polymer particles following the polymerization) significantly overlaps the claimed composition. The degree of substitution of the cationic starch is from 0.01 to 0.1 mole of nitrogen per mole of glucose units (col 8, lines 18-20), or from 0.09-0.9 wt-% nitrogen.

Auhorn et al does not disclose the amount of the cationic low molecular weight polymer emulsifier relative to the particles; however, it would have been obvious to one of ordinary skill in the art to use a similar amount to that disclosed for the cationic starch to obtain the same emulsifying effect.

The polymer particles produced have a mean diameter from 75 to 110 nm (0.075 to 0.11  $\mu\text{m}$ ), which overlaps the claimed particle size ranges (col 7, lines 10-12).

The art of Niinikoski et al, Auhorn et al and the instant invention is analogous as pertaining to the polymerization of ethylenically unsaturated monomers, including vinyl fatty acid monomers. Auhorn et al teaches using the claimed cationic starch and the claimed cationic synthetic polymers as functionally equivalent options in polymerization of vinyl polymers comprising vinyl fatty acid monomers. Niinikoski et al teaches that the claimed cationic starches are also used in polymerizing vinyl acetate polymers overlapping the claimed polymers. Absent convincing evidence of unobvious advantages, it would have been obvious to one of ordinary skill in the art to use the claimed cationic synthetic polymers as functional equivalents to cationic starch in polymerizing the vinyl acetate polymers of Niinikoski et al and to have a reasonable expectation of success. It further would have been obvious to obtain the claimed particle sizes because of the similarity of the ingredients and process to those claimed.

Auhorn et al does not disclose the viscosity of the synthetic cationic polymer (low molecular weight cationic emulsifier). However, in some embodiments the disclosed low molecular weight cationic emulsifier has the structure as claimed, a synthetic cationic polymer with a nitrogen content of less than 1 wt-%, thus would have the claimed properties. Where the claimed and prior art apparatus or product are identical or substantially identical in structure or composition, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). In other words, when the structure recited in the

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reference is substantially identical to that of the claims, the claimed properties or functions are presumed to be inherent.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DENNIS CORDRAY whose telephone number is (571)272-8244. The examiner can normally be reached on M - F, 7:30 -4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dennis Cordray/  
Examiner, Art Unit 1791

/Eric Hug/  
Primary Examiner, Art Unit 1791